B. Sc. I.T.

2nd Semester
Paper : Digital Electronics (BIT – 201)
Time Allowed : 2 ½ Hours

May – 2011
Maximum Marks : 80
Min. Pass Marks : 32

Note :- Attempt all questions from Section A & B, and only Two questions from Section C.

Section A : Very short answer type questions to be answered in about 20 words (Marks:2x8=16)

1.
   i) Solve in binary

$$(1-1001)_2 \times (10.101)_2 - (1.0101)_2$$

   ii) Why are NAND and NOR gates called Universal gates? ·
   iii) What is the difference between product term and min-term?
   iv) Define a full adder?
   v) Draw the circuit of an SR flip flop with NOR gates?
   vi) Define Up-down counter?
   vii) What is meant by distractive read-out?
   viii) Draw the circuit for a dynamic MOS RAM cell.

Section B : Short answer type questions to be answered in about 250 words (Marks : 4 x 8 = 32)

2. Draw the circuit for a two-input RTL gate and explain its working?
3. Minimize the following Boolean expression using K-map
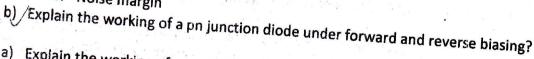$$f(a,b,c,d) = \Sigma(1,2,3,5,13) + \Sigma d(6,7,8,9,10,11)$$
4. Draw and explain a clocked SR flip flop?
5. Explain how two 16x4 RAMs can be connected to form one 16x8 RAM?

Section C : Long answer type questions to be answered in about 500 words (Marks:2x 16 =32)

6.
   a) Define the terms:
      i. Fan-in
      ii. Fan-out
      iii. Propagation Delay
      iv. Noise margin
   b) Explain the working of a pn junction diode under forward and reverse biasing?

7.
   a) Explain the working of a multiplexer?
   b) Realize the following function with a 8:1 multiplexer.

8. Discuss the design of a synchronous decade counter using T-flip flops and show output states and waveforms for each flip flop?

9.
   a) Explain linear and coincident selection in a RAM?
   b) Draw the circuit for a dynamic shift register cell and explain its operation?